



Arizona Department of Water Resources

Protecting Arizona's Water Supplies For Its Next Century

CONSERVATION-BASED WATER RATE STRUCTURES

INTRODUCTION:

Water rate structures play an essential role in communicating the value of water to customers. Since price influences the perceived value of a product, rate structures can be an important instrument in promoting long-term efficient use of water.

The appropriate rate structures helps communicate the value of water and encourages responsible use.

CONSERVATION WATER RATE STRUCTURES:

Conservation-based rate structures encourage the efficient use of water by charging customers more as water use increases. There are two types of conservation-based rate structures:

1. **Inverted or Increasing** structures have increasing rates – customers who use higher volumes pay more per unit of water.
2. **Seasonal or Off-peak** structures have increasing rates per unit of water during the peak demand season (for example, during the summer, a customer may pay more due to the increased demand).

Other types of rate structures exist that may actually encourage high water use and run contrary to conservation efforts as they provide no price incentive to use water efficiently:

1. **Uniform** rate structures have a flat rate per unit of water regardless of the volume used.
2. **Declining** rate structures have decreasing rates per unit of water as more water is used.

Rate structures are generally referred to as block or tier structures, where a uniform per unit fee is assigned to a specific volume range of water. Many variations and regional-specific considerations can be applied to setting each block volume.



EXAMPLES OF DIFFERENT CONSERVATION RATE STRUCTURES:

(Numbers in these tables are hypothetical and used only to illustrate different methodologies.)

1. Increasing Block Rate Structure

Gallons Used Block/Tier	Monthly Service Charge (\$)	Metered Water Rates (\$ / Kgal)
0 – 4,200	9.90	3.00
4,201 - 19,200	9.90	4.50
19,201 - 28,200	9.90	5.00
28,201 - 33,000	9.90	6.50
33,001 – 39,000	9.90	9.00
39,001 – 49,000	9.90	12.50
Over 49,000	9.90	15.00

2. Seasonal/Off-peak Block Rate Structure

Monthly Service Charge	Metered Water Rate (\$ / Kgal)	
(\$)	Oct –May	Jun – Sep
9.90	4.50	6.50



BENEFITS OF CONSERVATION RATE STRUCTURES:

Conservation-based rate structures are an effective way for water providers to encourage water conservation while offsetting the costs sometimes associated with implementing other types of water conservation programs. Benefits of conservation-based rate structures include:

- Reducing peak usage
- Reducing seasonal usage
- Rewarding efficient users
- Reducing total system demand
- Communicating an overall conservation consciousness
- Surcharging for nonessential and non-efficient water uses.

CONSERVATION FEES

Providers may also want to consider establishing a water conservation fee, which could be collected per customer per billing period and used to help fund water conservation programs.

EVALUATING EFFECTS OF RATE CHANGES:

A valuable first step when considering rate changes is comparing existing rate structures with conservation based rate structures.

The table to the right will help determine how revenue will be effected if a rate structure is implemented.

This exercise should be done for each customer class (commercial, residential, multi-family, etc.).

Line	Item	Value
1	Current price per gallon	\$
2	Current revenue-producing gallons (or cubic feet)	gallons
3	Current annual revenues (line 1 multiplied by line 2)	\$
4	Conservation goal (reduction in water use)	gallons
5	Conservation goal as percentage of current annual revenue-producing gallons (line 4 divided by line 2)	%
6	Estimate price elasticity of demand (by customer class and/or type of use if applicable)	%
7	Percentage change in price needed to induce conservation (line 5 divided by line 6)	%
8	Calculate revised price level (line 1 multiplied by (1.00 plus line 7))	\$
9	Revised annual water usage (line 1 less line 4)	gallons
10	Revised revenues (line 8 multiplied by line 9)	\$
11	Annualized fixed costs	\$
12	Annual variable costs for revised water usage	\$
13	Revised revenue requirements	\$
14	Net revenue effect (line 10 less line 13)	\$

EFFECTIVENESS OF RATE STRUCTURES

A study conducted in 2013 showed a reduction of 18% in residential water demand over three years due to rate structures based on water budget.

(<http://www.allianceforwaterefficiency.org/1Column.aspx?id=712>)

ISSUES TO CONSIDER WHEN IMPLAMENTING CONSERVATION RATE STRUCTURES:

- In most Arizona communities, rates are significantly lower than the true cost of acquiring water (pumping, treatment, delivery, replenishment, and obtaining new supplies), which may create customer resistance to paying higher rates.
- An effective rate structure should be designed so that water used for basic and essential needs costs less than water used for discretionary or non-essential needs.
- Rate changes should be publicized and explained so that customers understand why the change is necessary. It is important to show customers how much money could be saved by lowering water use to a less expensive block.
- Water providers have a natural reluctance to initiate conservation programs since revenue streams are based on water used.
- If water rates are designed appropriately, the rates paid by customers in high-water-use blocks may actually offset revenue loss from those in lower-water-use blocks.
- Rates should be adjusted so that the price of water reflects the cost of getting it to the customer; utilities should be able to balance their revenue stream to cover operation and maintenance and any increased costs associated with implementation of water conservation programs.
- A long-term conservation program can result in significant cost savings to the water system; it can extend the life of existing infrastructure and delay the costs associated with building new facilities or retrofitting old facilities to handle larger capacities.
- For private water companies, cost recovery for water conservation programs through a rate increase must be approved by the Arizona Corporation Commission (ACC). For more information, contact the ACC: www.azcc.gov or (800) 222-7000.





THE NEED FOR CONSERVATION RATE STRUCTURES IN ARIZONA:

Incentives to save water are not new. While several cities in Arizona do have seasonally adjusted or inverted block rates and conservation programs in place, data suggests that rate structures in Arizona have a wide variability in both pricing and opportunities for rate restructuring.

This variability is demonstrated by the AZ Water and Wastewater Rates Dashboard, created by the Arizona Water Infrastructure Finance Authority and the Environmental Finance Center. According to information gathered in June 2015 from about 400 Arizona water providers, the average monthly charge for a standardized study use of 5,000 gallons/month is \$29.40. The range of costs for this same gallon usage across the study sample ranged from a low of \$5.00 to a high of \$132.26. The Dashboard can be found here: <http://www.efc.sog.unc.edu/reslib/item/arizona-water-and-wastewater-rates-dashboard>.

“Rate structures have the advantage of avoiding the costs of regulation, restrictions, and policing while retaining a greater degree of individual freedom of choice for water customers.”

EPA How to Conserve Water and Use It Effectively

CONCLUSION:

Arizona’s water resources are limited, and conservation measures must be adopted to protect this valuable resource. This in turn will help ensure a continued economic prosperity and environmental health in Arizona, now and in the future. Perhaps one of the most effective ways to accomplish this is by making sure that the cost of water reflects its value and encourages customers to use it efficiently.

TO LEARN MORE:

To find practical information to guide utilities from development through implementation of rate structures that balance revenue management, resource efficiency and fiscal sustainability go to the Alliance for Water Efficiency’s Financing Sustainable Water website:

<http://www.financingsustainablewater.org/>

More information about conservation based water rate structures can be found on the Environmental Protection Agency website: www.epa.gov and on the American Water Works Association website: www.awwa.org. Private firms that specialize in water planning also offer assistance with rate studies and implementation.



FOR MORE WATER CONSERVATION INFORMATION:

www.azwater.gov/conservation
(602) 771-8585

